REMARKS

Herein, the "Action" or "Office Action" refers to the Office Action dated 5/28/2004.

Applicant respectfully requests reconsideration and allowance of all of the claims of the application. Claims 20, 30, 41-52, and 55 are presently pending. Claims amended herein are none. Claims withdrawn or canceled herein are none. New claims added herein are none.

Substantive Claim Rejections

Claim Rejections under §103

The Office rejects all of the pending claims under §103. For the reasons set forth below, the Office has not shown made a *prima facia* case showing that the rejected claims are obvious (under §103). Accordingly, Applicant respectfully requests that the rejections be withdrawn and the case be passed along to issuance.

The Office's rejections are based upon the following references:

- **Maeshima**: *Maeshima et al.*, US Patent No. 6,486,923 (issued 11/26/2002);
- **Kohn**: *Kohn et al.*, US Patent No. 6,570,990 (issued 5/27/2003);
- **Graf**: Rudolf F. Graf & William Sheets; *Video Scrambling & Descrambling: for Satellite & Cable TV;* Published by Newnes; Chapter 1 (November 1998).

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Overview of the Application

The Application describes a technology for preventing the unauthorized copying or use of the content of transmitted and/or stored information (e.g., video and/or audio signals).

In accordance with the teachings of the Application, a display adapter is rendered 5C Standard compliant, hence forming a "secure video card". This adapter includes an interface for coupling the card to a digital bus used to couple 5C standard devices such as a DVD player to other 5C Standard compliant devices. A content encryption key is maintained on the secure video card, thereby precluding decoding of the encrypted data, once stored, or it's copying.

This secure video card is designed to be tamper-resistant and to prevent easy access to unencrypted signals. Processing of the copyrighted information subject to the 5C Standard copyright constraints, in unencrypted form, is restricted, to occurring just on the card. In this way; many of the concerns copyright owners harbor concerning information being stolen, as the result of processing by the main CPU of a PC, can be avoided.

In addition to addressing 5C Standard compliance issues, the technology described by the Application addresses the concerns some copyright owners have regarding the transmission of video signals over analog lines.

In accordance with the teachings of the Application, analog video signals are transmitted from a source device (e.g., a video adapter) to a destination (e.g., display device such as a monitor) over a plurality (e.g., three, video signal lines). Prior to transmitting information to the destination device the identity of the destination device is confirmed via receipt, by the source device, of a certificate assigned to the destination device by a central authority.

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A session key, used as a content encryption key, is then generated and exchanged between the source and destination devices. The source and destination devices each includes a pseudo-random number generator that is driven by the session key.

The three video signal lines, which are used to transmit the red, green and blue analog video signals, are changed (e.g., swapped) on a periodic basis as a function of the output of the pseudo-random number generator in the source device.

In one embodiment, the red, green and blue signals are also altered (e.g., encrypted) by multiplying signal values by coefficients produced by the pseudo-random number generator thereby frustrating any decoding of these video signals by detecting correlations among the signal values. An input to the pseudo-random number generator in the destination device is synchronized with the random number generator in the source device via the exchange of session keys.

The number generator in the destination device drives a decryption circuit which performs an inverse swapping and multiplying operation to that performed by the source device, thereby re-generating the analog red, green and blue color signals. In this manner, the video signals received on the three analog lines can be properly recombined to form proper red, green and blue video signals.

The video adapter, described by the Application, can detect when it is coupled to a display device when the latter is also implemented in accordance with our technology described by the Application. When connected to a conventional display device, the video adapter limits its display output to non-encrypted analog video signals which do not include information subject to a restriction precluding transmission over unencrypted analog transmission lines.

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When connected to a display device that has been implemented in accordance with the technology described by the Application, the video adapter generates encrypted analog video signals and periodically exchanges a session key with the display device, which, in turn, is used for decoding the transmitted video signals. Thus, the display adapter provides some degree of backwards compatibility in that it can be used with existing monitors and with new display adapters that embody our technology described by the Application.

Cited References

The Office cites **Maeshima, Kohn,** or **Graf** as its primary references in its obviousness-based rejections. The Office cites one or more of these same references for its secondary references in it obviousness-based rejections.

Maeshima

Maeshima describes a color picture display technology employing an array of light-emitting diodes or other light-emitting elements emitting different colors. A television signal is converted to monochromatic signals of the different colors. A color converter modifies the monochromatic signals, thereby changing the displayed hues to match the hues that would be displayed on a television screen, to compensate for ambient lighting conditions, or to achieve other desired effects. If each picture element has only a single light-emitting element, the modification preferably avoids unlit gaps in monochromatic areas of the displayed picture.

The technology described in **Maeshima** enhances the displayed image. It does not add an element of security to prevent the use of the image during

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transmission. Rather it adds and element to enhance the image for display on a particular type of display technology.

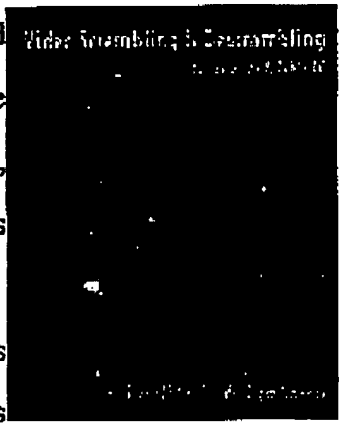
Kohn

Kohn discloses system controls reproduction of a video transmission between a transmitter and a receiver. The system includes an encryptor with an offset generator adapted to receive the encrypted frame key and to generate a sequence, of pseudo-random values for the color component; and an adder coupled to the offset generator and to the color component signal for providing an encoded color component signal.

The system also includes a decryptor with a decryptor offset generator adapted to receive the encrypted frame key and to generate a decryptor pseudo-random value for the color component; and a subtractor coupled to the offset generator and to the color component signal for subtracting the offset signal from the color component signal.

Graf

Graf provides the "how and why" of encoding and decoding video signals. Most of the current methods are discussed, with information on analog/digital conversion, phase-locked loops, digital techniques and IC data sheets included.



Chapter 1 is labeled the "Introduction" and it introduces of the concepts related video scrambling and descrambling. As

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part of that it briefly discusses the topics of encoded signals, scrambling techniques, descrambling, coding/decoding systems, audio transmission, chroma transmission, audio encryption, and cable system approaches.

Obviousness Rejections

Lack of *Prima Facie* Case of Obviousness (MPEP § 2142)

Applicant disagrees with the Office's obviousness rejections. Arguments presented herein point to various aspects of the record to demonstrate that all of the criteria set forth for making a *prima facie* case have not been met.

Based upon Maeshima and Graf

The Office rejects claims 20 and 55 under USC § 103(a) as being unpatentable over **Maeshima** as modified by **Graf**. Applicant respectfully traverses the rejections of these claims. Applicant asks the Office to withdraw its rejection of these claims.

Claim 20

With the cited portions the references provided in brackets, this claim recites:

- pseudo-randomly generating at least one of a plurality of matrix coefficients, a1, a2, a3, b1, b2, b3, c1, c2, c3; **[Maeshima: Fig. 2, items ra, rb, and rc]**
- using an encryption circuit to perform a matrix multiplication operation to generate the encrypted analog first, second, and third signals, according to the following equations:

$$R' = a1R + b1G + c1B,$$

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G' = a2R + b2G + c2B,

B' = a3R + b3G + c3B;

[Maeshima: col. 4, top of page]

- wherein the matrix coefficients are generated such that each of the R', G' and B' signals will be the product of summing two signals in the set of analog signals R, G, B and subtracting one of the signals in the set of analog signals R, G, B. **[Graf: page 4, Sine-Wave Scrambling through the end of page 6]**

This claim specifically recites, "pseudo-randomly generating...matrix coefficients." However, **Maeshima's** coefficients are either stored or externally programmable. (See, col. 2, lines 11-13).

The Office relies on **Maeshima** to show this particular claimed element/feature (namely, pseudorandom generation of matrix coefficients). Since it doesn't, Applicant submits that the combination of **Maeshima** and **Graf** fails to disclose all of the features and elements recited in this claim. Therefore, the claim is not obvious in light of this combination.

Furthermore, the Office admits that **Maeshima** does not disclose that the matrix coefficients are generated "such that each of the R', G' and B' signals will be the product of summing two signals in the set of analog signals R, G, B and subtracting one of the signals in the set of analog signals R, G, B," but indicates that **Graf** does.

In reading the cited section of **Graf** (page 4, Sine-Wave Scrambling through the end of page 6), Applicant sees a discussion of the addition and subtraction of a sine-wave signal and its affect on the video signal. However, that action does not appear to match what is recited in the claim.

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Indeed, Applicant is unable to match the text from the cited section of **Graf** to the claimed language. Applicant asks the Office to please identify, with particularity, where **Graf** discloses one signal (e.g., R', G', B') is the product of the summing of two of analog signals from a set of three analog signals (e.g., R, G, B) and the subtraction of one of the signals in the same set.

Applicant respectfully submits that the Office has not presented objective and specific evidence sufficient to show that the combination of the teachings of **Maeshima** and **Graf** disclose all of the recited elements and features of this claim.

Accordingly, Applicant asks that the Office withdraw its rejection of this claim.

Claim 55

With the cited portions the references provided in brackets, this claim recites:

- pseudo-randomly generating an encryption value; **[Maeshima: Fig. 2, items ra, rb, and rc]**
- multiplying a first one of said first, second, and third analog input signals with said encryption value to produce a multiplied signal; **[Maeshima: Fig. 2, items 501, 502, or 503]**
- combining said multiplied signal with at least a second signal generated from a second one of said first, second, and third analog input signals to produce said encrypted analog signal; **[Maeshima: Fig. 2, items 504 and 505]**
- wherein said encryption value is a matrix coefficient **[Maeshima: col, 3, lines 53-61]** and wherein said matrix multiplication operation is performed using analog multipliers **[Graf: page 4, Sine-Wave scrambling uses frequency components added together to scramble the data]**

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This claim specifically recites, "pseudo-randomly generating an encryption value" and the "encryption value is a matrix coefficient." However, **Maeshima's** coefficients are either stored or externally programmable. (See, col. 2, lines 11-13).

The Office relies on **Maeshima** to show this particular claimed element/feature (namely, pseudorandom generation of matrix coefficients). Since it doesn't, Applicant submits that the combination of **Maeshima** and **Graf** fails to disclose all of the features and elements recited in this claim. Therefore, the claim is not obvious in light of this combination.

Applicant respectfully submits that the Office has not presented objective and specific evidence sufficient to show that the combination of the teachings of **Maeshima** and **Graf** disclose all of the recited elements and features of this claim.

Accordingly, Applicant asks that the Office withdraw its rejection of this claim.

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Based upon Kohn, Maeshima, and Graf

The Office rejects claim 30 under USC § 103(a) as being unpatentable over **Kohn** as modified by **Maeshima** as modified by **Graf**. Applicant respectfully traverses the rejections of these claims. Applicant asks the Office to withdraw its rejection of these claims.

Claim 30

With the cited portions the references provided in brackets, this claim recites:

- using a pseudo-random number generator to generate output values; **[Kohn: Fig. 2, item 200]**
- modifying first, second and third signals, by performing a matrix multiplication operation thereon utilizing matrix coefficients which are a function of at least one of the pseudo-random output values, the modified first, second and third signals being encrypted analog signals so as to define first, second and third encrypted analog signals; **[Maeshima: Fig. 1, item 50]**
- transmitting the first, second and third encrypted analog signals to a destination device; **[Kohn: Fig. 1, Item 134]**
- wherein said matrix multiplication involves summing an integer multiple of two of the first, second and third signals and subtracting an integer multiple of another one of said first second and third signals to produce the first encrypted analog signal. **[Graf: page 4, Sine-Wave Scrambling through the end of page 6]**

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No Motivation to Combine References

Applicant asserts that there is no motivation to combine the teachings of **Kohn** and the teachings of **Maeshima**.

Kohn describes techniques for protecting HD video signal and it utilizes encryption and pseudo-random number generators to do that. **Kohn** does not (and the Office has not cited anywhere that it does) disclose the use of matrix multiplication of some or all of the video signals. Instead, it utilizes a pseudo-randomly generated offset and signal addition.

On the other hand, **Maeshima** utilizes matrix multiplication, but no encryption techniques. Since the purpose of **Maeshima** is to enhance and improve the signal rather than protect it, **Maeshima** does not disclose any signal neither encryption techniques nor any pseudo-random number generation.

Applicant submits that there is no suggestion, teaching, or reason given by one reference that would motivate one of ordinary skill in the art at the time of the invention (hereinafter, "OOSA") to combine it with the teachings of the other reference.

Kohn says nothing that would motivate OOSA to look towards **Maeshima** and combine their teachings. **Kohn** is silent on the subject of signal multiplication.

Likewise, **Maeshima** says nothing that would motivate OOSA to look towards **Kohn** and combine their teachings. **Maeshima** is silent on the subject of video signal security.

Accordingly, Applicant submits that OOSA would not be motivated to combine the video-signal security techniques of **Kohn** with the video-enhancing signal multiplication techniques of **Maeshima**.

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Furthermore, the Office admits that nether **Kohn** nor **Maeshima** discloses that "the matrix multiplication involves summing an integer multiple of two of the first, second and third signals and subtracting an integer multiple of another one of said first second and third signals to produce the first encrypted analog signal," but indicates that **Graf** does.

In reading the cited section of **Graf** (page 4, Sine-Wave Scrambling through the end of page 6), Applicant sees a discussion of the addition and subtraction of a sine-wave signal and its affect on the video signal. However, that action does not appear to match what is recited in the claim.

Indeed, Applicant is unable to match the text from the cited section of **Graf** to the claimed language. Applicant asks the Office to please identify, with particularity, where **Graf** discloses summing an integer multiple of two of the first, second and third signals and subtracting an integer multiple of another one of said first second and third signals to produce the first encrypted analog signal.

Applicant respectfully submits that the Office has not presented objective and specific evidence sufficient to show that the combination of the teachings of **Kohn**, **Maeshima**, and **Graf** disclose all of the recited elements and features of this claim.

Accordingly, Applicant asks that the Office withdraw its rejection of this claim.

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Based upon Graf and Kohn

The Office rejects claims 41-46 under USC § 103(a) as being unpatentable over **Graf** as modified by **Kohn**. Applicant respectfully traverses the rejections of these claims. Applicant asks the Office to withdraw its rejection of these claims.

Claim 41

With the cited portions the references provided in brackets, this claim recites:

- generating a first decrypted analog signal from a first pair of encrypted analog signals by:
  - summing the two encrypted analog signals in the first pair of analog signals to produce a first sum; and
  - dividing the first sum by a first value to produce a first decrypted analog signal.

[Graf: page 4, Sine-Wave Scrambling through the end of page 6]

On page 9 of the Action, the Office states, "**Kohn** et al. teaches performing the steps for three different decrypted analog signals (fig. 3)" and admits that **Graf** does not show this. However, that element/feature ("performing the steps for three different decrypted analog signals") is not found in this claim. Rather, it is found in claim 43, which depends this claim.

Applicant submits that a §103 (obviousness rejection) is unfounded here for this claim. So, Applicant will assume that the Office intended to reject this claim under §102 (anticipation) and that the Office intended to assert that **Graf** shows all

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of the elements and features of this claim. Applicant asks the Office to please correct any misunderstandings here.

Applicant submits that Graf does not show all of the recited elements and features of this claim.

Similar to previous rejections, the Office cites "page 4, Sine-Wave Scrambling through the end of page 6" of **Graf**. While Applicant sees a discussion of the addition and subtraction of a sine-wave signal and its affect on the video signal, that action does not appear to match what is recited in the claim.

Indeed, Applicant is unable to match the text from the cited section of **Graf** to the claimed language. Applicant asks the Office to please identify, with particularity, where **Graf** discloses generating a first decrypted analog signal from a first pair of encrypted analog signals by summing the two encrypted analog signals in the first pair of analog signals to produce a first sum; and dividing the first sum by a first value to produce a first decrypted analog signal.

In particular, where does **Graf** disclose a *pair* of encrypted analog signals? Where does it disclose the generation of that *pair* of encrypted analog signals by *summing* and *dividing*? Where does it disclose that the signals of the *pair* of encrypted analog signals *are summed*? Where does it disclose that the *first decrypted analog signal is the result of dividing* the sum of the signals of the *pair* of encrypted analog signals *by particular value*?

Applicant respectfully submits that the Office has not presented objective and specific evidence sufficient to show that **Graf** discloses each and every element and feature of this claim. It also has not shown that the combination of the teachings of **Kohn** and **Graf** disclose all of the recited elements and features of this claim.

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Accordingly, Applicant asks that the Office withdraw its rejection of this claim.

Claims 42-52

These claims ultimately depend upon independent claim 41. As discussed above, claim 41 is allowable.

In addition to its own merits, each of these dependent claims is allowable for the same reasons that its base claim is allowable. Applicant submits that the Office withdraw the rejection of each of these dependent claims because its base claim is allowable.

Based upon Graf, Kohn, and Maeshima

The Office rejects claims 47-52 under USC § 103(a) as being unpatentable over **Graf** as modified by **Kohn** as modified by **Maeshima**. Applicant respectfully traverses the rejections of these claims. Applicant asks the Office to withdraw its rejection of these claims.

Claims 42-52

These claims ultimately depend upon independent claim 41. As discussed above, claim 41 is allowable.

Furthermore, these claims are allowable for reasons similar to those described above for the allowability of the other rejected claims.

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In addition to its own merits, each of these dependent claims is allowable for the same reasons that its base claim is allowable. Applicant submits that the Office withdraw the rejection of each of these dependent claims because its base claim is allowable.

Dependent Claims

In addition to its own merits, each dependent claim is allowable for the same reasons that its base claim is allowable. Applicant submits that the Office withdraw the rejection of each dependent claim where its base claim is allowable.

Conclusion

All pending claims are in condition for allowance. Applicant respectfully requests reconsideration and prompt issuance of the application. If any issues remain that prevent issuance of this application, the Office is urged to contact the undersigned attorney before issuing a subsequent Action.

Respectfully Submitted,

Dated: 8-30-04 By: _____

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